Paving the Way Forward for Rural Finance
An International Conference on Best Practices
Case Study

Agribusiness: Vendor Financing in Input Markets

A Comparative Study of Fertilizer Credit in Bangladesh

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This case study was made possible by support provided in part by the US Agency for International Development (USAID) Agreement No. LAG-A-00-96-90016-00 through Broadening Access and Strengthening Input Market Systems Collaborative Research Support Program (BASIS-CRSP) and the World Council of Credit Unions, Inc. (WOCCU).

This paper is based on data and information generated under the Fertilizer Distribution Improvement Project, financed by United States Agency for International Development and implemented by the International Fertilizer Development Center. The analyses and conclusions are those of the authors and do not necessarily reflect the views of IFDC. The paper was made possible through the cooperation of IFDC.

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Introduction

This presentation provides a snap-shot of credit delivery in a liberalizing market for fertilizer. For seven years prior to the study that it is based on, the Government of Bangladesh, with assistance from the US Agency for International Development[1], had been taking steps to extricate public agencies from their central roles in importing and distributing fertilizer and to allow a larger role for private enterprises in these activities. These were central goals of the second Fertilizer Distribution Improvement Project (FDI II).

The effort to expand private sector participation in fertilizer distribution required that some means be found to finance transactions across the market channel. The implementers of the FDI II Project, in collaboration with USAID, the Government of Bangladesh, and with commercial banks and private sector fertilizer distributors, developed financing mechanisms that utilized the existing resources and capabilities of the commercial banking system to achieve this. At the start, FDI project resources were used to fund credit-in-kind through the Bangladesh Agricultural Development Corporation (BADC). But, as the parastatal's role in the fertilizer market declined, demand for this credit also declined and the Project focused on other mechanisms for providing finance to the sector.

In 1989, FDI II resources began to flow to the Bangladeshi Central Bank through the project's Commercial Credit Program (CCP). This program allowed the Central Bank to rediscount loans made by commercial banks to fertilizer importers, distributors and wholesalers. Upon receipt of a letter of request and evidence of loan agreements, the Central Bank released funds to participating banks freeing the funds that they (the participating banks) had originally committed to the fertilizer loans. Between 1989 and 1990, US $15 million was provided to the Central Bank for this program. By 1994, CCP resources had grown to US $26 million, largely through counterpart contributions and retained interest. In addition, by the end of the project, banks were using more of their own funds to finance fertilizer loans.

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[1]The Fertilizer Distribution Improvement Project began in 1978, but, during its first phase, it focused on improving the institutional capability of the Bangladesh Agricultural Development Corporation – the lead agency for fertilizer distribution. It was not until 1987 and the second phase of the project that efforts were extended to reduce the role of BADC and to increase the role of the private sector in fertilizer trading.

The CCP fund was useful in expanding commercial credit for fertilizer trading. While there are questions about how remunerative fertilizer lending was for the participating banks, they drew down the project resources and they contributed their own funds to this type of lending. All of this financial activity resulted in increased competition in the fertilizer market and improved availability of fertilizer on a timely basis.

The expansion of bank credit for private fertilizer transactions is important for a number of reasons, but, what is of particular interest to the current study is the way in which credit was distributed through the transaction channel. In particular, did bank credit to wholesalers or distributors increase the incidence of *supplier*, or, *trade credit* for retailers?.

Trade credit is the financing of a sale by the seller of the good. Fertilizer provides a good example of the usefulness of trade credit for financing transactions. Fertilizer is an input to a production process that takes time. Because of the ubiquitous lack of purchasing power among farmers at planting seasons, small farmers often find it difficult to finance this lag between the purchase/application of fertilizer and the generation of a return. However, if a retailer is willing to finance the purchase, whether in part or in full, then this problem is overcome.

Trade credit for fertilizer at the retail level places the financing problem with the retailer. That is, by financing the sale, the retailer bears the financial cost of the lag between using and earning a return on fertilizer. Typically, this problem is resolved by factoring the finance cost into the sale price of the fertilizer. Alternatively, the retailer might obtain his fertilizer through financing from his supplier. In that event, the wholesaler bears the financial cost of the lag.

By examining the use of bank credit and trade credit in the developing private sector market for fertilizer in Bangladesh, it is shown that, across all levels of the transaction channel, formal credit does increase the incidence of trade credit. It has been argued, elsewhere[2], that trade credit is improved technology for extending credit. The information that sellers have about the business prospects of their (repeat) buyers helps to lower commercial risk. Bankers tend to pay for such information, but traders have it as a by-product of their normal business. For this and other reasons, trade credit is considered a useful substitute for some lines of formal bank lending.

Much of the empirical research into trade credit has focused on access to trade credit – looking at the demand side. The present study examines the supply of trade credit, with particular reference to traders' access to bank finance for their purchase of fertilizer. Such formal lending might be expected to have an impact on traders' ability to finance the transaction with their customers.

[2]See Baydas (1997), Cuevas (1993), and Isaksson (2002)

The Setting

The Lenders

Initially, 14 banks participated in the CCP. This total represented about one-half of all the commercial banks in Bangladesh. Thirteen of these banks comprise the sample of banks providing data for this study. These included four nationalized commercial banks (NCBs) and nine private commercial banks (PCBs). Among the latter group, two were denationalized commercial banks (DCBs), two were Islamic banks and the rest were simply private commercial banks (PCBs). In 1989, when the CCP got under way, about 165 branches extended fertilizer loans. By the end of the project, the number of participating branches had climbed to 395 – a 139 percent increase.

In addition to finance through the banking system, trade credit was an important financing alternative for fertilizer traders. Importers financed 40 percent of their sales with trade credit, while distributors financed 44 percent of their sales, wholesalers financed 38 percent of their sales, and retailers financed 32 percent of their sales with trade credit.

The Borrowers

At the time of the study (1993), importers at the top of the fertilizer marketing channel relied on bank credit to finance 63 percent of their fertilizer investment. The second-most important source of financing for importers was their own equity (34 percent).

Distributors used bank credit to finance 26 percent and trade credit to finance 35 percent of their fertilizer investment. Wholesalers used bank credit for 10 percent and trade credit for 36 percent of their fertilizer investment.

Retailers only received about 4 percent of their fertilizer investment from bank credit. Trade credit accounted for 46 percent of their investment and equity capital made up 45 percent.

One of the objectives of the CCP was to encourage fertilizer distributors, wholesalers, and retailers to pass credit on to the next level in the market network so credit could be extended to farmers. By the fourth year of the program, when this study was undertaken, this was clearly happening. In addition to helping transactions through trade credit, however, the CCP also provided formal sector instruments to facilitate these transactions. For instance, when GOB implemented a policy to allow direct fertilizer sales from Bangladesh's fertilizer factories to the private sector, initially the means of payment was cash. Under the CCP, payments were allowed by demand draft (DD) and pay orders (POs). But constraints and risks in arranging cash

payments and the use of demand drafts were considerable, especially when fertilizer deliveries were substantially behind pay order requirements.
To solve these problems, in 1990/91, FDI-II staff worked with the banks to develop a new instrument, the Inland Letter of Credit (ILC), similar to a letter of credit. It was adopted as a legal financial instrument issued by commercial bank to other banks as an agreement to honor, within a specified limit, all bills paid by the receiving bank on behalf of a particular trader. Payment through ILCs to the factories often involved lower bank charges. It alleviated risk and did not block distributors funds with the Bangladesh Chemical Industries Corporation (BCIC) for prolonged periods.

Market Characteristics

At the end of May, 1994, the total value of current fertilizer loans outstanding was US$ 24 million. NCBs held about 31 percent of the current sanctioned fertilizer loans, with the remainder held by the PCBs. The Islami Bank was the lead fertilizer lending bank, with about 36 percent of the total loans to the sector. The Agrani Bank ranked second with nearly 20 percent of the current sanctioned fertilizer loan amount.

Utilization of available credit (calculated as the loan amount outstanding divided by loan amount sanctioned) for all commercial banks during the six months ending May 1994 shows a peak of 75 percent occurring during November 1993. Utilization of current lines of credit bottomed out during March 1994 at 48 percent. During March 1994, the credit utilization ranged from 56 to 67 percent for all commercial banks except the Islami Bank. Intuitively, this figure appears high because inventory levels were the lowest during March 1994 and the fertilizer season for the Boro crop had effectively ended.

Loan Conditions

Loan terms and conditions

The Banks use several different loan instruments for fertilizer credit. The two main instruments are: hypothecated loans, wherein the fertilizer that is bought with the proceeds of the loan supplies the security for it, and, pledged loans, wherein the fertilizer is actually stored by the Bank or its agents and is only released on evidence of sale. About 75 percent of all fertilizer loans from banks are secured through hypothecation.

The amount that could be borrowed against the value of the fertilizer being bought with the loan was significantly different among these two types of loans (hypothecated and pledged security). For all banks, the ratio of the value of the secured fertilizer to the loan amount was 3.28 to one when the primary security was hypothecated, and 0.19 to one when the primary security was pledged.

The average maturity for fertilizer loans averaged 11 months for all banks. But, this average ranged from 10.8 months for the PCBs to 15.35 months for the Islami Bank.

The nominal interest rate on fertilizer loans ranged from 11 to 14 percent per annum. As the Islamic banks are barred from charging interest, per se, they assess a charge that amounts to 15 (Islami Bank) and 17 percent (Al Baraka) against returns to the loan. In addition to interest paid to the banks, borrowers also incurred significant transaction costs in accessing credit from formal lenders. These transaction costs added another 4.6 percentage points on borrowing, bringing the average loan cost to 18.8 percent per annum.

While high, the interest rates charged on fertilizer loans were roughly in line with rates charged on other business activities in Bangladesh and these rates did not, in general, provide the lenders with a positive return on investment when all costs (including commercial risk) were factored into the equation.

Portfolio health by lender

The fertilizer loan portfolios of all commercial banks combined had a seasonally adjusted arrears rate of 32 percent. The DCBs had the lowest delinquency rate at 25 percent. The Islami Bank had the highest delinquency rate at 44 percent (24 percent seasonally-adjusted). NCBs had the highest seasonally-adjusted delinquency rate at 40 percent as compared to all PCBs at 27 percent. The Agrani Bank was the best performer with a loan delinquency rate of only seven percent.

If international standards were applied, the NCBs would have to write off one-third of their fertilizer loan portfolio. For all PCB's this the at-risk portfolio is 14 percent. Only 11 percent of the Islami Bank fertilizer loan portfolio would be classified as bad debt even though their delinquency rate is 44 percent. The performance of the Agrani Bank is best with only three percent of its arrears aged greater than six months.

Bank Credit and Trade Credit Across the Market Channel

Forty eight percent of all classes of fertilizer traders utilized bank credit of some kind. In general, importers and distributors were more likely to have access to credit than retailers. In

terms of credit available, importers had 66.7 percent of the total, distributors had 19.4 percent, wholesalers had 12.1 percent and retailers had 1.8 percent.

The data do not allow a separation of bank loan arrears by fertilizer trader type. However, data are available for trader credit delinquency rates by type of trader. These are shown in Table 1, below. While there are some differences among the different types of fertilizer traders, there is no clear trend in delinquency rates across these groups.

As noted, above, for all classes of fertilizer traders, trade credit is an important mechanism for increasing sales. Importers finance 40 percent of their sales with trade credit, while distributors and wholesalers finance 44 and 38 percent, respectively, of their sales in this way.

Table 1: Trade Credit Delinquency Rates by Fertilizer Trader Group

Delinquency Rate	Type of Fertilizer Trader				
	Total	Importer	Distributor	Wholesaler	Retailer
0%	13%	25%	16%	12%	14%
0 - 10%	54%	50%	42%	55%	56%
10 – 20%	7%	0%	11%	7%	7%
> 20%	26%	25%	31%	26%	23%
Total	100%	100%	100%	100%	100%

Source: 1994 IFDC Credit Survey of Fertilizer Traders

The standard surety for trade credit is familiarity between the seller and the buyer. Over 80 percent of the traders who buy fertilizer on credit (with the seller) had business relations with the seller for more than two years. The average length of the business relationship between traders sharing trade credit was six years.

No interest was charged by 96 percent of the traders offering trade credit for fertilizer and the term of the loan is open-ended. However, some down-payment is typically required and it is expected that the buyer will repay the credit soon after selling the fertilizer. In addition, while there is no explicit interest charge, a discount on the sale price is sometimes offered when repayment is made quickly. This implies that the seller is capturing some finance cost in the sale price of the fertilizer.

Toward a Model for Credit Supply to the Fertilizer Sector

As suggested in the introduction, trade credit can expand markets for inputs that require time (among other things) to generate returns. But, trade credit merely passes the onus of financing the lag from the buyer to the seller of the input. At some point in the market channel, there is a role for a financial institution to provide credit to finance this production lag. In the model described below, we assess the impact of bank credit for fertilizer and some other market characteristics on the supply of trader credit in this market.

Description of the Model

A model was created to test the hypothesis that trade credit is dependent on access to bank credit and a number of other explanatory variables. Specifically, the model relates the volume of trade credit to:

i.) access to bank credit,
ii.) loan interest rates,
iii.) length of relationship between buyer and seller
iv.) down payment required for the sale
v.) the type of relationship between buyers and sellers, and
vi.) the number of traders operating in the market (e.g., distributors, wholesalers and retailers).

It is expected that access to credit would be positively related to the supply of trade credit. Rather than relating trade credit to the volume of bank credit, a dummy variable was used for this parameter with a one representing access and a zero representing no access. While most trade credit carried no explicit interest charge, larger transactions did require interest payments. In this sense, interest charges can be thought of as a rationing mechanism, past some critical size level.

The length of the relationship between the buyer and seller would be expected to have a positive effect on the supply of trade credit, as would the use of a down payment on transactions. The type of relationship was also installed as a dummy variable, with a one representing a business-type relationship and a zero representing a non-business relationship. It was expected that the business relationship would increase the likelihood of trade credit being offered and that the sign, therefore, would be positive.

The number of distributors, wholesalers and retailers operating in the market provides some measure of the degree of competition for fertilizer business. Increased competition would be expected to increase the need for sales expanding practices such as trade credit and the expected sign for this parameter was positive.

Findings

Using data generated by the fertilizer credit survey, the model explained 44 percent of the variance in the supply of trade credit. The effect of access to bank credit was, as expected, positive. The variable estimate was significant. Likewise, both the interest rate and the down payment variables were significant explanatory variables and they carried the expected signs.

Surprisingly, the length of the suppliers business relationship with the buyers/borrowers was not a significant variable in the model. Whether values for this variable moved in tandem with some other variable or whether its impact was truly insignificant is not known. The coefficient for the dummy variable for the type of relationship, on the other hand, was positive and significant.

Among the "competition variables", only the number of wholesalers was significant at the .05 level. The number of distributors was significant and positive at the .10 confidence level, but the number of retailers carried a counter-intuitive sign and was not significant. These findings are summarized in Table 2, below. The strength of the "access to credit" variable and the size of the coefficient indicates that, in fact, the availability of bank credit increases the availability of trade credit in a substantial way.

Table 2 Parameter Estimates of the Trade Credit Supply Model

Explanatory Variables	**Coefficient**	**Standard Error**	**T-Value**
Constant	-0.39	0.27	-1.44
Access to Bank (Fertilizer) Credit	2.52	0.23	10.8*
Trade Credit Interest Rate	0.28	0.07	3.97*
Length of Business Relationship	0.01	0.03	0.54
Down Payment	0.002	0.001	2.43*
Type of Relationship	0.85	0.25	3.41*
Number of Distributors	0.02	0.01	1.74**
Number of Wholesalers	0.05	0.01	4.22*
Number of Retailers	-0.01	0.01	-1.35

R-squared = 0.44
Significant at .05 confidence level
Significant at .10 confidence level

Recommendations

The development of financial instruments and supporting methodologies that can sustain the relationship between a borrower and a lender benefits both the banking sector and fertilizer marketing in Bangladesh. Risk can be reduced by altering the terms and conditions associated with financial instruments. The following recommendations to improve credit delivery for the fertilizer sector address this need for more appropriate financial instruments.

Introduce variable lending interest rates that account the risk characteristics of borrowers. Banks currently do not charge differential interest rates based on the risk characteristics of the borrower. In this way, good borrowers subsidize other borrowers who have yet to prove their creditworthiness. This policy may result in resources flowing to investments that bring lower risk-adjusted returns, undermining the commercial objectives of bank operations. [Note: Since this paper was written, variable interest rates have become commonplace in fertilizer lending in Bangladesh.]

Design loans to counter *loan diversion* incentives. Most fertilizer traders have other lines of business. Slow or non- repayment of fertilizer loans often derives from using resources that might repay those loans for other types of investment. The unusually high credit utilization of the lines of credit during off-peak months for the fertilizer trade support this assessment. Where monitoring and loan supervision are weak, lines of credit allow the borrower to invest available funds wherever there seems to be a good return and the goal of reducing the outstanding balance on accounts becomes less compelling. This problem could be addressed by shortening the repayment period for lines of fertilizer credit, or by improving conditions and controls for traders' uses of these.

Increase the use of security pledging in order to create more value at less risk in fertilizer loan portfolios. Banks have a difficult time securing collateral because of inefficiencies in the legal system, though this is clearly changing. There is also a high ratio of loan amount overdue to loan amount sanctioned. This is an indication that delinquent borrowers are having a difficult time repaying loans. The exception to this high ratio was found at the Islami Bank. The lower ratio at the Islami Bank can be attributed to the type of financial contract used – one in which the loan contract requires pledging the primary security. Because pledged security remains in the possession of the bank until it is sold, closer loan supervision is achieved.

Take a harder line on the practice of renewing loans without full adjustment of the outstanding balance. Renewal of line of credit loans without full adjustment of the outstanding balance is tantamount to loan rescheduling. In this, over time, the lender losses information about the borrowers ability (or, willingness) to repay the loan. Periodic balancing of fertilizer loans should be required.

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